Silent dialogue? Combining land and water reforms in small-scale irrigation schemes in South Africa

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Abstract

In South Africa, with the advent of democracy, both land and water institutions have undergone, and are still undergoing reform measures, especially to address equity and promote rural development. However, despite the apparent inter-linkages of land and water in rural livelihoods and agricultural development, the implementation of such reforms has been done separately. Water reform advocates for the registration and licensing of all non-domestic water use. In terms of the National Water Act (1998), water should be governed in a decentralised manner where new institutions (Water User Associations – WUA, and Catchment Management Agencies – CMA) are established to encourage user participation in decision making, efficiency and equity in water use. On the other hand, in the framework of land reform, with the future implementation of the Communal Land Rights Act of 2004 (CLARA), communal land is to be restructured, probably privatised. Two major questions come to the fore: Does the separate implementation of the water and land reforms have implications for rural livelihoods and agricultural development, particularly regarding inconsistencies of water and land rights respectively? Would articulating the two reforms lead to improved opportunities to address equity and promote rural development? Field work conducted on the communal small scale irrigation schemes of Nzhelele and Thabina highlighted not only the lack of coherence between the land and water reform programmes, but it also showed the implementation constraints of the programmes individually. Although articulating land reform to water reform seems necessary – the lack of effective implementation of water reform remains an obstacle, constraining rural livelihoods and agricultural development. In addition, for it to effectively address equity and promote rural development, it seems necessary for the water or land reforms to be linked to broader agrarian reforms, taking into consideration support services, market access and the overall rural, often multiple, livelihoods and strategies.

Keywords: *water and land reform, water and land rights, small-scale irrigation schemes, South Africa*

1. Introduction - The separate implementation of land and water reform in South Africa

As rural economies are mainly agrarian based, their development is linked to access to natural resources (Leach *et al*, 1997). Land and water form part of the most

crucial of these natural resources. Since land and water are finite and scarce resources, access to them needs to be regulated, particularly to achieve equity and sustainability.

Institutions, both formal and informal, are the basis by which local communities gain access and exert control on the use of resources like land and water. In South Africa (SA), both land and water institutions have undergone reform measures with the advent of democracy, especially to address the racially motivated unequal access occasioned by segregatory colonial rule and apartheid.

The democratic government of SA introduced the *Water Act No.36* in 1998, which mainly sought to achieve sustainability, efficiency and equity in water resources management (SA, 1998). For this to be done effectively, government has adopted the integrated water resources management (IWRM) framework, which emphasises the principles of decentralisation and user participation (DWAF, 2004). The new legislation allows users to participate in decision making by decentralising water management to catchment levels, and to local levels where users form a Water User Association (WUA) (Jaspers, 2001). On the land side, government is dealing with insecure communal land tenure found mostly in the former homelands, through the Communal Land Rights Act (CLARA). Although CLARA is still to be implemented, it aims at creating institutions to better define and secure ownership and use of land (SA, 2004). This ownership can be on the communal, co-operative basis, or in the extreme case, might lead to individualised privatisation (Anseeuw, 2006).

However, despite the apparent inter linkages of land and water in agrarian livelihoods and economies, the implementation of such reforms has been done separately. The issue of the lack of links between water and land rights is problematic, particularly in emerging and small scale irrigation farms. As such, under the NWA, only WUAs may apply for an irrigation water use license and may be granted the right to use non domestic water (SA, 1998). Linked to the individualisation of land rights this could become a problem, as failure to become a member would limit individuals' right to use water (Perret, 2002). Also, through tenure reform, co-operatively managed communal land may be transformed into scattered, individual plots if members opt for privatisation. This leads to a communal water right to be replaced by several individual private water rights. Where there are transfers of land rights, through the land market, there may also be a loss

of water rights because a water right is held separately from the land right. The new land owner has to go through a separate process to acquire water rights.

Communal areas have had a history of underutilisation of land (Kamara *et al*, 2002). Currently, there is fallow land in communal small scale irrigation schemes (SIS), even in cases where water is available. Given the possible individualisation of land rights, will this improve the SIS farmers' access to water and utilisation of plot land? In addition, WUAs are likely to impose water management rules and schedules, which are often sources of conflicts and discontentment in farming communities (Faysse, 2004).

The paper aims at identifying the problems arising from the uncoordinated implementation of land and water reforms. According to the problem identified, the main objective is to analyse the potential contribution of land tenure reform on small holder irrigation on communal land.

2. Research Methodology – Assessing productivity and land use in two irrigations schemes in the Limpopo Province of SA

An empirical enquiry was done using case studies. The case study sites picked for the studies are both in the Limpopo Province of SA. Limpopo is one of the country's major commercial agricultural regions, and the implementation of water reform started in this Province in 2005. As a result, the trajectory of the success or failure of a WUA can already be assessed.

Two sites were analysed in order to allow comparison. These two schemes were chosen because they are on communal land that is set to undergo land tenure reform; they have active irrigation farming going on and the schemes have officially undergone water reform. The two SIS identified are Nzhelele and Thabina.

Nzhelele Irrigations Schemes consist of 13 villages lying along the Nzhelele River Valley. The area is located to the North of the city of Polokwane in Limpopo, in the rural part of Vhembe District Municipality. The farmers settled in this area in the 1950s after being displaced by white commercial farmers to the North. The government then established the schemes in 1963, with each village getting a scheme on its communal arable dry land. Thabina Irrigation Scheme consists of four sections (called Wards)

stretching along the Thabina River.[1] Thabina lies North East of Polokwane, 24km to the South East of the town of Tzaneen, in the Capricorn District Municipality of Limpopo. It is in a peri-urban area. Unlike in Nzhelele, communal land was identified near the community in 1962, where the government built the scheme. Community members from the surrounding villages who were interested in farming were allowed to join.

2.1 Sampling

Purpose sampling was employed to collect data. In Nzhelele, accessing all the village schemes was difficult. After observing landuse and water use patterns in the 13 villages and noticing the similarities, it was apparently unnecessary to study all the schemes. Rather, the study was confined to the four village schemes on the upper reaches of the scheme that were much easily accessible. These four village schemes have 210 households, of which 21 (10%) were interviewed using a questionnaire prepared by the research team. Respondents were purposively selected to strike a balance between those utilising all their land and those who were partially utilising land. In Thabina, since Wards C and D have no irrigation farming going on, farmers were sampled from Wards A and B only. The two Wards have 75 farmers. Interviews were conducted with 20 of these farmers (27%). Again, respondents were purposively selected to balance fully productive with partially productive farmers. In total, 41 farmers occupying 64.30ha of land were interviewed. This sample was considered to be representative of the complexity and diversity of the land and water issues under investigation.

2.2 Data Collection

For the two case studies, primary and secondary data was collected. Regarding the primary data, interviews were conducted with the farmers using semi-structured questionnaires. Respondents were interviewed while working on their plots to ensure that the study captured the responses and understanding of people involved in farming, not just the land owners. Once identified, the farmers were purposively categorised into those who were fully utilising their land and those who were not. In an effort to balance responses, an almost equal number between the two categories was aimed at. In the end

[1] These are scheme demarcations, not administrative wards

18 farmers fully utilising their plots, 21 not fully utilising and two not farming at all were selected for interviewing. Table 1 illustrates the samples.

Key informant interviews were also conducted to understand the history of land rights and water governance in the case study sites. These informants included the tribal authority officers, extension officers, scheme chairpersons, WUA committee members and government officials (mainly from the Department of Agriculture) in charge of or concerned with the SIS at the municipal office. The interviews gathered information on local land administration, implementation of water reform, understanding of scheme dynamics, appreciation of challenges faced by SIS farmers, the working of local institutions, and government's plan of action and future priorities.

Lastly, participatory observations were done, helping to assess the infrastructure used and to measure plot sizes. Observations also validated respondents' answers, especially on water access and use, farm size and landuse. Acts of parliament, white papers and information booklets were also used for secondary data.

2.3. Data Analysis

Data was analysed within the Institutional Analysis and Development (IAD) scientific framework. Developed by Ostrom and others (1994), IAD focuses on how rules (institutions) and attributes of the physical and cultural world combine to shape outcomes. According to Ostrom (1998), the institutional process is affected by three variables: attributes of the physical world, attributes of the community concerned and rules in use that create incentives and constraints. In the action arena, the variables combine to influence interactions among players. Any change in the variables will trigger new interactions among players and consequently, new outcomes are realised. In light of the current physical availability of both land and water, the incoming institutional arrangements will be assessed to determine they will lead to changes in the way that farmers use land and water resources.

In order to assess these new activities, on communal land, plot productivity is used to measure landuse. Plot usage at family and community level, and land transfers, are the variables used to discuss results. Since tenure reform is still to be implemented, analysis is done on a scenario basis. The unit of analysis in both case studies are the

farmers. Data analysis utilised descriptive statistics: Frequency and descriptive statistical analysis were implemented on land tenure, landuse, productivity and water use.

3. Results and Analyses – Low productivity and inefficient land use in SIS

3.1 Household Demography and Income

The household demography reveals a very elderly farming population, with the majority of farmers being well into the pension age (average age of 64.2 in Nzhelele and 62.5 in Thabina). Nzhelele households are larger, with an average of 6 members per household, compared to 4.4 members for Thabina. Such demographic family structures inevitably lead to a high dependency ratio in Nzhelele, at 7.9 dependents for each working adult, but much lower in Thabina, at 1.6.

The farmers depend on a diverse portfolio of livelihoods, namely employment, agriculture, remittances, independent activities and government welfare grants. The average yearly income per household is ZAR 21,746 in Nzhelele and ZAR 40,142 in Thabina. As the heads of households are relatively old, government welfare grants, consisting of old age pensions and child grants, represent the major part of the households' income. Welfare grants comprise on average 38.6% of total household income (67.0% in Nzhelele and 20.0% in Thabina). Agriculture on the other hand, represents an average of 37.5% (12.3% in Nzhelele and 52.0% in Thabina) of total household income

With employment, remittances and industrial activity contributing 24% of income, 62.6% of the households' income, on average, is thus from non agricultural sources for the two schemes. However, besides social grants, agriculture provides more income than all the other activities farmers pursue (fetching more than employment, remittances and independent activities put together). Table 2 shows the different sources of income.

3.2 Access to Land

Land administration is under the traditional authority, using a permission to occupy (PTO) certificate issued by the chief. The majority of farmers have the PTO in

both schemes: 14 in Nzhelele and 14 in Thabina. However, several do not have this PTO for various reasons: nine are renting, while four in Nzhelele were never issued with PTOs. These farmers are from one particular village which started as an informal settlement and therefore had no recognition from the traditional authority.

Leasing of land is officially not allowed in both schemes, but in practice it happens among farmers. Since this renting is unofficial, there is no documentation for it, only verbal agreements between leaser and lessee. A total of nine farmers are actually renting plots from friends or relatives. Table 3 shows the number of farmers on each tenure arrangement.

3.3. Access to Water

In both schemes, water is drawn via a weir and transported by underground pipes to overnight storage dams. From there it is delivered by open canals to the plots, where furrow irrigation is used to water crops. A scheme committee draws up an irrigation timetable where each farmer gets two days in a week to irrigate. Farmers pay R6/month as a contribution to the wages of the water bailiff, but not for the water.

Water reform has been implemented in the schemes, but not effectively. It seems water reform has failed to maintain the infrastructure, nor improve water supply. While WUAs have been formed, they are not operational and as a result, there is no change in the way water is accessed or used. There is no payment for water and there are no water rights or licences, a direct violation of Chapter 4 of the new Water Act (1998), which stipulates that all non domestic water use (water use falling under Schedule 1 of the Water Act) should be licensed. The schemes are run by government through Extension Officers, not by the farmers, contrary to the principles of decentralised water management. Water allocation is also based on time – not quantity of water used, making it impossible to measure the amounts of water used. Although water reform emphasises efficiency, these schemes are still using the wasteful flood irrigation method, which also damages soil structures and reduces yields (Postel, 2000).

The water reform implementation has been so ineffective that by the time of the study, 66% of all the respondents were not aware of water reform, nor of the existence of their own WUA. The reform is also set to take longer to establish because running the

SIS on a cost recovery basis, as WUAs should do, will be difficult. The current small plots do not yield enough cash income to cover water charges, maintenance and running costs. Given the farmers' average income, it is also unlikely that they will afford to self finance the schemes.

3.4. Plot Utilisation and Crop Income

Land is underutilised in both schemes. Of the 41 plots assessed, 39 were under crops at the time of the study, while two were not being farmed at all. Out of the 39, 21 plots (11 and 10 for Nzhelele and Thabina respectively) are not being fully utilised. The two schemes together have a total of 64.30ha, but only 41.16ha were being cultivated during the time of study. Nzhelele farmers are cultivating an average 0.90ha per farmer and Thabina farmers are cultivating an average of 1.13ha per farmer, while an average of 1.30ha and 1.85ha are available per farmer respectively. On average, only 64% of of arable land from both schemes is being farmed.

A variety of crops are grown, with maize being the most common one in both schemes. (15.80ha of the 18.67ha productive land of Nzhelele and 16.50ha of the 22.50ha of productive land in Thabina, representing over 78% of total farmed land). Other crops are tomatoes, beans and spinach, with one farmer growing cabbages in Thabina. A few farmers grow groundnuts and sweet potatoes in Nzhelele, and one farmer has a hectare under butternut in Thabina. However, these crops form a very small portion of both total cultivated land and total income in each scheme.

Farming in Thabina is more market-oriented than in Nzhelele, where 64.7% of maize and 62.5% of sweet potatoes produced are consumed. In contrast, Thabina farmers sell their entire production of maize, tomatoes, cabbage and butternut. While part of the green beans and sweet potatoes are consumed, this only constitutes 5% or less. In Nzhelele, the market is largely local and very limited, as farmers sell mostly among themselves while peri-urban Thabina have access to an urban market.

3.5. Productivity

Not only is land use and plot income low, but also productivity. Plot productivity was measured using yields (evaluated in ZAR terms) per hectare.

Thabina farmers are more productive, with an average productivity of ZAR 22,077.10/ha per year, a figure much higher than the ZAR 13,722.00/ha for Nzhelele (Table 4). When productivity is measured for only the land under crops, the figures rise by over ZAR 1,000.00 in each case. A brief comparison of the productivity figures will show that land is under producing.[2] For maize, the National Department of Agriculture (NDA) average production is 6.0ton/ha. Nzhelele is producing only 1.4ton/ha, rising to 2.1ton/ha if we consider only land under crops. This represents 76.7% and 65.0% under performance rates respectively. Thabina is faring better, but still under performing with 2.6ton/ha only, the figure rising to 5.0ton/ha if we consider only productive land. These are under performance rates of 55.0% and 16.7% respectively. Even for vegetables, production is also way below the NDA averages. Cabbage is 20% below average, green beans 50% below average and for spinach; it is much less at 30%.

Land productivity is below optimum in both schemes. Besides the clear reason of not fully utilising plots by some farmers, plot production is still low for that land under crops especially in Nzhelele.

3.6. Constraints to Farming

Low productivity is linked to the farming constraints experienced by the farmers. Farmers identified lack of water as the major constraint – 81.0% in Nzhelele and 90.0% in Thabina. This pertains to inadequate water supply and lack of infrastructure to draw water. Irrigation water lacks despite water reform having been implemented in the area. As a result, no major improvements can be done on the plots without irrigation water.

Shortage of land is not regarded as a farming constraint by the majority of farmers. While some farmers require more land than they have, most are interested in more secure land rights. In Nzhelele, 38.1% of farmers said they need more land, compared to none in Thabina. None of the farmers identified land rights as a constraint. However, 76% of all respondents said they preferred private land rights to the current PTO. Farmers were asked if they will lease or sell their land after privatisation, only 23% are willing to rent out their land after privatisation, and none are willing to sell.

[2] The National Department of Agriculture (NDA) statistical section provides an average yield estimate for irrigated maize crops and vegetables

Another major problem is the lack of capital to buy inputs. This was mentioned by 57.1% of the farmers in Nzhelele and 70.0% in Thabina. The cost of land preparation is so high that SIS farmers end up ploughing only part of their total land. Since the majority of communal farmers are pensioners, they lack not only the physical capacity to manually till the land but also adequate income to pay for land preparation and buying of inputs. Ploughing is done by hired tractors, which have become too expensive for some farmers at ZAR 750 per ha during the time of study. A 50kg bag of Ammonium Nitrate fertiliser was costing around ZAR 330. As a result, farmers do not (try to) increase productivity through increased inputs.

Lastly, access to markets, mentioned by 7.3% of respondents, is also a problem. Markets play an important role in income contribution and type of crops grown. The choice of crops is closely linked to market opportunities found in both schemes. As detailed before, Thabina is in a peri-urban area, and their agriculture is more market oriented. That explains why they fetch more income from agriculture. On the other hand, the more rurally located Nzhelele farmers farm for consumption and only sell the surplus. The very limited local market share fails to give incentives to farmers. Consequently, their agricultural income is minimal. Table 5 illustrates respondents' farming constraints.

4. Discussion - The necessary but not sufficient combination of land and water reform

When land tenure reform will be implemented, private land rights will be given on either individual or community basis. It is expected that more effective land use will ensue, as land rights will allow farmers to privately hold, lease or sell land. As such, all land, it is expected, should therefore be put under crops, increasing productivity and achieving self sufficiency. It will 'awaken dead capital', in De Soto's (2000) words.

This assumption is based on the view that it is an unclear land rights system that has contributed to the current underutilisation of land. Given that the farmers not fully utilising their plots are not leasing part of their land because of some perceived vulnerability, this view is understandable. It partly explains why 76% of the farmers are in favour of land property titles.

However, land rights alone will not guarantee increased landuse. Two main reasons stand out. The first is that in the present SIS setting, land property rights alone will not create a land market. Although the majority of farmers want land tenure reform, they seem to want the title deeds more for protection from traditional authority than for production reasons. This implies that very few currently active farmers will be able to get more land for use after tenure reform. Farmers evidently value land more as a safety net than as a productive asset (Denison and Manona, 2007). The creation of a land market through leasing and selling is therefore not going to automatically begin after privatisation because the majority of farmers have no intention of selling or leasing land.

The second reason is the multiple livelihoods nature of communal SIS households. These alternative sources of income take away the incentive to fully utilise the available land. Kamara *et al* (2002) say that for farmers to take any serious interest in farming, agriculture has to provide a larger proportion of household income. Farming is not the major household income provider here, characterising only a small part of the total household income like in all small-scale farms in South Africa (Perret *et al,* 2005).

Besides the two reasons, other factors detailed earlier will still hinder agricultural production after privatisation, notably the cost of inputs, lack of market opportunities and the lack of irrigation water.

As shown by the Institutional Analysis and Development (IAD) framework, the physical environment, consisting of the resources and the characteristics of the community, combines with the rules in use to influence access to resources in the community (Ostrom, 1990). In this study, farmers have low household incomes, pursue multiple livelihoods and are on communal land, surviving mainly on government welfare grants. They also lack access to markets, have little productive capacity and tend to value land sentimentally. These attributes exist in a community where access rules are undergoing transformation. Having been used to decades of communal ownership of land and water, the farmers are unfamiliar with rights and privatisation. There is not only a lack of knowledge on how rights work, but also an apparent sceptical appreciation of the incoming rules.

Rules in use are still communal when it comes to land and although they are supposed to be private for water, they are also still based on common use. As a result, the

schemes are in transition to new rules (rights). It is therefore quite difficult to effectively assess the action arena and rank the outcomes.

However, results show that no significant changes might take place in the action arena after the new policies are implemented. The new policies alone are not enough to create new interactions or institutions at local level, like land and water usage and trading rights. As mentioned in the previous section, the water policy has not been effectively established to take effect and to amend historically built institutions, which is not happening in this case. For example, water use has not changed. In addition, it is shown that land tenure reform, when implemented, is also unlikely to lead to any new outcomes, as it is not taking into consideration the context and needs of the farmers. Renewed land rights alone seem insufficient to increase productivity (when water reform is ineffective and markets and inputs, within a multiple livelihoods context, are not considered). To use Ostrom (1998), although the policy environment has changed, attributes of the community concerned and rules in use that create incentives and constraints have not. Subsequently, there will not be any significant new interactions among actors and between actors and resources, leading to no new outcomes.

The failure of water reform is not surprising. Research has shown that new water institutions have largely been very ineffective and not beneficial to the previously disadvantaged (Swatuk, 2005). This is mainly due to a weak conceptualisation of new water policies (Manzungu, 2004). There was no capacity building or adequate stakeholder consultation when the WUAs were established. Water reform has not changed farmers' situation, as it was not effectively implemented, and immediate water needs still remain a major constraint.

5. Conclusion – The need for a more integrated, overall reform of the agricultural and rural sector

Clearer land rights will bring tenure security, but land rights alone will be inadequate to increase productivity, Cousins (2009), pointed out. Water rights have failed to take effect, resulting in no improved access to water. There is obviously a need for a coordinated approach for land and water reform, especially given that water reform was

attempted but land is still communally owned and the water rights are not working. However, there will be a limit to potential benefits of land tenure and water reforms, whether articulated or implemented separately or together. While most of the communal farmers feel vulnerable under the current tenure arrangements and refuse to prefer privatisation, leasing or selling of land is in the majority of the cases improbable even after privatisation of land rights. And farming challenges like market access and cost of inputs have solutions that are outside the scope of land-water reforms.

So linking land to water reform might have a positive impact, but the latter is not guaranteed and would remain limited. As such, SA's land and water reform will not make farmers self sufficient, nor will it increase productivity, promote self-sufficiency and reduce poverty. To effectively address equity and promote rural development water-land-reform should be linked to broader agrarian reforms, considering support services, market access and the overall rural multiple livelihoods in SA. Farmers need a more integrated, overall reform of the agricultural and rural sector.

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List of Tables

Table 1: Communal land sample

Study site	Sample popn	No. intrvwd	No. fully using plots	No. not fully using plots	No. not farming at all
Nzhelele	210	21	9	11	1
Thabina	75	20	9	10	1
Total	**285**	**41**	**18**	**21**	**2**

Table 2: Farmers' Household Income

Source		Nzhelele (ZAR)	Thabina (ZAR)	Combined (ZAR)
		N=21	**N=20**	**N=41**
Gross Agricultural Income (Rand)	Min Max Average Std deviation	0 20 330 2 687 4 954	0 76 200 20 782 18 442	0 76 200 11 514 16 052
Employment (Rand)	Min Max Average Std deviation	0 14 400 1 305 3 582	0 0 0 0	0 14 400 668 2 618
Independent Activities (rand)	Min Max Average Std deviation	0 19 200 1 029 4 129	0 60 000 5 050 14 144	0 60 000 2 990 10 391
Remittances	Min Max Average Std deviation	0 12 000 2 144 3 924	0 60 000 5 350 13 472	0 60 000 3 693 9828
Welfare (old age pension, child grant)	Min Max Average Std deviation	0 36 000 14 611 10 175	0 24 000 9 000 9 437	0 36 000 11 874 10 106
Total	Min Max Average Std deviation	7 800 42 000 21 746 10 310	11 000 85 000 40 142 20 456	7 800 85 000 30 739 18 411

Table 3: Land Rights

	Nzhelele N=21	**Thabina N=20**	**Combined N= 41**
Farmers with PTO	14	14	28
Farmers who are renting	3	6	9
Farmers with no tenure rights	4	0	4

Table 4: Plot's crop income per hectare - production

		Nzhelele N=21	**Thabina N=20**	**Combined N=41**
Land Productivity (yr) ZAR/ha	Min	0.00	0.00	0.00
	Max	46 668.00	72 400.00	72 400.00
	Average	13 722.00	22 077.10	17 797.60
	Std deviation	13 205.10	19 523.10	16 914.80
Land Productivity (yr) ZAR/ha (for cropped land only)	Min	2 500.00	8 640.00	2 500.00
	Max	46 668.00	72 400.00	72 400.00
	Average	15 166.42	23 239.00	19 202.71
	Std deviation	13 062.42	19 334.49	16 780.92

Table 5: Constraints to Farming

Constraint	**Positive Responses**					
	Nzhelele		**Thabina**		**Combined**	
	# farmers	%	# farmers	%	# farmers	%
Land tenure/rights	2	9.5	0	0.0	2	4.9
Land scarcity	8	38.1	0	0.0	8	19.5
Low product prices	3	14.3	0	0.0	3	7.3
Lack of market outlets	2	9.5	1	5.0	3	7.3
Lack of irrigation water	17	81.0	18	90.0	35	85.4
Labour	2	9.5	1	5.0	3	7.3
Lack of money/capital	12	57.1	14	70.0	26	63.4
Lack of infrastructure	3	14.3	1	5.0	4	9.8